

## Review Article

## Medication errors: a focus on nursing practice

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### Abstract

**Objectives** Health departments endeavor to give care to individuals to remain in healthy conditions. Medications errors (MEs), one of the most types of medical errors, could be venomous in clinical settings. Patients will be harmed physically and psychologically, in addition to adverse economic consequences. Reviewing and understanding the topic of medication error especially by nurses can help in advancing the medical services to patients.

**Methods** A search using search engines such as PubMed and Google scholar were used in finding articles related to the review topic.

**Key findings** This review highlighted the classifications of MEs, their types, outcomes, reporting process, and the strategies of error avoidance. This summary can bridge and open gates of awareness on how to deal with and prevent error occurrences. It highlights the importance of reporting strategies as mainstay prevention methods for medication errors.

**Conclusions** Medication errors are classified based on multifaceted criteria and there is a need to standardize the recommendations and make them a central goal all over the globe for the best practice. Nurses are the frontlines of clinical settings, encouraged to be one integrated body to prevent the occurrence of medication errors. Thus, systemizing the guidelines are required such as education and training, independent double checks, standardized procedures, follow the five rights, documentation, keep lines of communication open, inform patients of drug they receive, follow strict guidelines, improve labeling and package format, focus on the work environment, reduce workload, ways to avoid distraction, fix the faulty system, enhancing job security for nurses, create a cultural blame-free workspace, as well as hospital administration, should support and revise processes of error reporting, and spread the awareness of the importance of reporting.

**Keywords:** health policy; pharmaco-economics; quality of care; management; epidemiology

## Introduction

Health administrations, all over the world, endeavor to give proper care to individuals when they are ill or to remain healthy. Primary care services are increasingly concentrated at the heart of integrated people-centered health care systems in many countries.<sup>[1]</sup> They provide a passage point with a useful framework focused on progressing health planning to ensure safety for individuals and their families. Availability and safe application are basics to accomplish all-inclusive wellbeing criteria and to support the United Nations sustainable development goals, that organize solid lives and advance prosperity for all.<sup>[2]</sup>

The therapeutic services' framework is very unpredictable. It includes basic circumstances of hazard, a collaboration between different experts and institutions, and relies upon huge help from innovations. The attributes of the therapeutic framework may increase the danger of slip-ups and compound the results of these mix-ups.<sup>[1, 3]</sup> In this sense, it is vital to evaluate hazards and harm to patients in the scan for extreme patient wellbeing. The World Health Organization's meaning of patient wellbeing builds up of which pointless damage or potential harm related to therapeutic services ought to be decreased to a worthy least.<sup>[4]</sup>

Healthcare providers consider patient safety one of the paramount priorities in clinical settings. One of the major threats to the well being of patients is medical errors.<sup>[5]</sup> One of the main branches of medical errors is medication errors which were demonstrated to be the source of morbidity and mortality in addition to the resulted adverse economic consequences.<sup>[6–8]</sup> Patient safety is esteemed as a critical issue for our social insurance framework and human services providers,<sup>[9]</sup> and in such manner, medication errors are utilized as a list to survey quiet wellbeing in clinics. In the next sections, we will go through the concept, classification, types, causes, consequences, reporting, and those strategic plans to prevent the occurrence of medication errors.

## Concept and incidence of medication errors

A medication error is characterized by ignoring the condition of shaping harm, hazard, or any evadable frequency to happen amid the procedure from medicine ordering to patient consumption.<sup>[10, 11]</sup> It might be characterized by National Coordinating Council for Medication Error Reporting and Prevention (NCCMERP) as any preventable occasion that may cause, or prompt improper medicine use or patient harm while the medicine is in the control of the health-care worker, patient, or buyer.<sup>[12, 13]</sup> The measurement of medication errors may vary widely in clinical settings due to the different ways of recognizing and defining the status of medication errors, how to calculate error rates, variation in numerator/dominator, and the process, documentation, and culture of settings technologies.<sup>[14–16]</sup>

Medication errors are a global issue where 5.0% is deadly, and almost 50.0% of those are preventable.<sup>[17]</sup> The in-hospital incidence for adverse drug events was reported to be high which ranged from 2 to 6 events per 100 admissions.<sup>[18, 19]</sup> Moreover, around 7000–9000 patients' deaths in the USA each year can be attributed to medication errors.<sup>[11, 20]</sup> However, the rate of patient serious injuries as a result of medication errors among different studies varies, 1–2%,<sup>[21]</sup> 9–13%,<sup>[22]</sup> 29.0%<sup>[23]</sup> and 51.8%<sup>[24]</sup> and almost 30.5% death rate per year in the United States because of medication errors.<sup>[25]</sup> As indicated by the Institute of Medicine (IOM) of the National Academies in 2006, 400 000 instances of avoidable patient damage because of medication errors happen every year in emergency clinics in the

USA. It is noticed that 19% of medication errors in the Intensive Care Units (ICUs) are life-threatening and 42% are considered to be paramount for further maintaining treatment.<sup>[26, 27]</sup> Somewhere in the range of 44 000 and 98 000 emergency clinic patients have been evaluated to kick the bucket every year because of drug errors.<sup>[28]</sup> For instance, in the USA hospitals in 1995, the annual spending on medication errors for each hospital was around 2.9 million dollars and a 17% reduction in the error incidence led to 480 000 dollars saving per hospital as in the case of transcription errors.<sup>[29]</sup> For example; a patient in an Iranian hospital had given 80 units of insulin instead of eight units which led to the patient's death, therefore, the government gave 140 million dollars to the patient's family.<sup>[14, 30]</sup> Add up, the overall cost of adverse outcomes that are associated with medication errors could surpass 40\$ billion each year.<sup>[11]</sup> Bates *et al.* stated that medication errors increase the costs for each patient by 2000–2500\$ and extend their hospitalization period by at least two days.<sup>[18]</sup> The total cost of these errors, including expenses of error, disability, and lost income and productivity, is expected to be between \$17 billion and \$29 billion per year.<sup>[31, 32]</sup>

## Classification of medication errors

Grouping of medication errors occurrence into contextual, modular, or mental (psychological) is considered an ideal protocol to assess how errors happen. Contextual order assesses the specific time, place, medications, and individuals who are included. Modular characterization analyses the manners in how errors occur (i.e, by omission, repetition, or substitution). Mental order is preferred, as it clarifies occasions as opposed to just prescribing them. Its burden is that it focuses on humans as opposed to frameworks wellsprings of errors. The accompanying mental grouping depends on crafted by Reason on errors and there are four distinct types of medication errors.<sup>[33, 34]</sup>

The first type is 'Knowledge-based errors' (Learning absence). As it may seem, administering penicillin to the patient without any concise information whether the patient is unfavorably susceptible. Knowledge-based errors that are connected to any kind of knowledge which could be related to expert, specific, or general. As a general knowledge, health care providers should understand that allergic reactions, for instance, could be associated with penicillins, however, realizing that the patient is allergic to penicillin can be considered specific knowledge. On the other hand, experts are those who may know that co-fluampicil has penicillin. As a result, Knowledge-based errors might be provoked when ignoring any of that information. In an Australian examination, correspondence issues with trouble in getting to suitable medication dosing data added to knowledge-based errors.<sup>[35–39]</sup> When being educated about medication is being given dispensed to patients could reduce the incidence of medication errors.<sup>[40]</sup> Errors can be blocked from occurrence through computerized prescribing entry orders, bar-coded medicine frameworks, and cross-checking by others (for instance, medicine specialists and nurses).<sup>[41, 42]</sup> A study showed that before implantation of electronic Bar-Coded Medication Administration (BCMA-e MAR), wrong time (33.9%), omission (27.7%), wrong technique (18.0%), wrong dose (13.3%), and unauthorized drug (2.9%) were happening frequently. However, after the implementation of BCMA-e MAR, errors have been declined.<sup>[43]</sup> In another study, error rates were reduced more than a half after applying BCMA-e MAR.<sup>[44]</sup>

The second type is 'Rule-based errors' (utilizing a terrible standard or twisting a decent principle). For instance, infusing diclofenac into the sidelong (lateral) thigh instead of being injected into the butt cheek. Appropriate standards and instruction help

to keep away from these kinds of errors, as do computerized prescribing frameworks.<sup>[38, 39, 45–47]</sup>

The third type is 'Activity-based errors' (known as slips). For example, when confusion happens between two drugs like diazepam and diltiazem from a medicine store rack.<sup>[38, 46, 47]</sup> In the Australian examination, most errors were because of slips in consideration that happened amid routine prescribing, dispensing, and administering organization. Slips errors could be minimized through keeping away from distraction, by cross-checking, by naming prescriptions plainly, and by utilizing identifiers, for example, standardized identifications or barcoded; alleged 'Tall Man' lettering (when blending lower- and upper-case letters in the same word) which showed to be a good protocol in the prevention of misreading of names, yet tall-man lettering has not been assessed in genuine conditions.<sup>[48]</sup> A branch of specialized technical errors of activity-based errors, for instance, as seen in measuring the incorrect amount of potassium chloride into an infusion bottle. Using agendas, safeguard frameworks, and computerized updates could prevent this type of error from occurring.<sup>[49, 50]</sup>

The fourth type is 'Memory-based errors' (so-called lapses). For instance, giving penicillin to a patient, with a known history of allergy, but forgetting that the patient is allergic. These are difficult to keep away from; however, computerized prescribing frameworks and cross-checking can reduce the error incidence.<sup>[50, 51]</sup>

## Other classifications and types of medication errors

Errors might provoke in any stage.<sup>[52–54]</sup> Prescribing errors (during drug prescription), transcription errors (wrong/incomplete transfer information from a prescription), dispensing errors (disagreement between medicine dispensed and prescription), administration errors (during drug administration), discharge summaries errors (due to discrepancy between discharged summaries and medical records), and monitoring errors (while taking the medicine of renal and liver).<sup>[30]</sup> Karthikeyan *et al.* reviewed the occurrence of errors among health-care providers.<sup>[55]</sup> (a) Prescribing errors; were presented as follow; drug-drug interaction (68.2%), incomplete prescription (25.0%), monitoring (12.6%), incorrect drug (13.0%), underdose (12.6%), incorrect interval (12.0%), and overdose (7.0%). (b) Nursing errors; as in wrong rate (34.0%), wrong time administration (28.6%), wrong dose (25.3%), medication omitted (24.0%), wrong fluid (22.4%), wrong drug (21.1%), wrong route (19.9%), and wrong patient (19.7%). (c) Pharmacist errors; as in wrong medication (25.0%), excessive dose (23.0%), poor labeling (23%), wrong dosage errors (21.8%), wrong strength (10.8%), wrong quantity (6.9%), and wrong direction dispensing (2.3%).<sup>[55]</sup> Prescription and administration types of medication errors are considered common and can contribute up to 65.0%–87.0% of medication errors.<sup>[56]</sup> According to the National Patient Safety Agency (2009) in the United Kingdom, it was observed the most prominent kinds of medication errors were 16.0% in prescribing, 18.0% in dispensing, and 50.0% in the drug administration.<sup>[57]</sup> Furthermore, medication errors accounted to be 37.6% of administration errors, 21.1% of prescription errors, and 10.0% of transcription errors in Iran.<sup>[58]</sup> On the other hand, previous studies showed that in prescription errors mainly occurred at out-patient ward accounted as (39.0–44.0%) and in emergency wards were (60.0–73.5%), however, transcription errors were accounted 16.9% and 13.8% for inpatient and discharged patients, respectively, while discharge summaries errors accounted 16.0–36.0% of (omission, drug name, administration route, drug dose, and drug

regimen).<sup>[59, 60]</sup> There were 192 477 medication errors reported by staff from 482 hospitals through voluntary reporting that could occur at any stage. Errors during administration were accounted to be (33.0%), documentation (23.0%), dispensing (22.0%), prescribing (21.0%), and monitoring (1.0%). Also, errors were related to omission (25.0%), dosage (30.0%), unauthorized drugs, and the wrong time, patient, and administration technique.<sup>[61]</sup>

Moreover, 0.078 errors per patient, and 0.029 errors per medication mainly because of dosing errors, drug omission, and wrong frequency errors.<sup>[62]</sup> A previous study showed that (94.0%) out of 430 errors were omissions and only 6.0% of errors caused a major impact on patients' life but was not considered as a life-alarming errors.<sup>[63]</sup> Medication errors are also related to the problem of wrong phenomena. These incorporate errors of course of medication, doses, timing, patient, and inability to follow up the patient.<sup>[53, 64]</sup>

Prescription errors are a standout amongst the most widely recognized therapeutic errors and their occurrence rate in adult ward accounted to be 5.6 cases per 1000 patients and 14.8 cases per 1000 patients in the pediatrics ward.<sup>[65]</sup> As seen, a sample of 57 nurses in pediatric settings, medication errors were 67.0% compared to 56.0% of a sample of 227 nurses working with adults.<sup>[64, 65]</sup> The occurrence of prescription errors in pediatrics is three-times higher than adults. An examination in Canada showed that the number of children who admitted to the emergency clinic accounted to be 5000 because of medication errors and of these, 2500 experienced moderate to serious side effects.<sup>[66]</sup> Prescription errors can happen because of human errors just as from fundamental errors and thus is needed for a cautiously monitoring through medication organization.<sup>[10]</sup> It is suggested that at whatever point when medication error has occurred it should be reported to the significant manager, and such notice is essential for understanding the reasons for the errors and to enable strides to be taken to lessen such errors later on.<sup>[67]</sup> The most frequent types of prescribing errors might be related to the inability to manage the medication and mistaken medication writing.<sup>[68]</sup> On the other hand, certain variables add to the high rates of prescription errors in pediatric patients. These incorporate inability to peruse the remedy, distraction, high patient/nurture proportion, and hard to get the accessibility of the right medications as endorsed.<sup>[65]</sup> Few investigations have tended to show the rates and reasons for medication errors in grown-up patients, and these examinations have regularly been founded on reports from nursing staff.<sup>[69, 70]</sup> Moreover, few investigations have inspected medication errors from the viewpoint of pediatric nurses.<sup>[65]</sup>

The error might be identified with expert practice, which is related to human services items, to systems, or to correspondence issues including prescribing, ordering, item naming, labeling/packaging, preparation, compounding, dispensing, administration, education, and the best possible utilization of medicines.<sup>[2, 11, 71]</sup>

## Causes of medication errors

Patients are sometimes being harmed by incidents despite the safe and effective health services that are provided to them. Medication errors have been considered a global issue and it is essential to focus on the causes, results, and solutions.<sup>[11, 72]</sup> The proportion of medication errors among nurses varies in different studies, it was 57.4% in Ethiopia,<sup>[16]</sup> 42.1% in Jordan,<sup>[15]</sup> 41.9% in Australia,<sup>[73]</sup> and 28.9% in the USA.<sup>[38]</sup> Thus, differences in rate are due to differences in organizational reporting systems, and the time frame of studies that have been conducted. Medication errors incorporate not just undesirable impacts from prescriptions, yet additionally incorporate

ordering, transcription, dispensing, administration and organization mistakes.<sup>[11, 74]</sup> Medication errors are more barely characterized than unfavorable medication occasions and incorporate mistakes of commission and omission. Errors of commission happen while abusing one of the five privileges of organization: right medication, patient, portion, course, time, and documentation. An error of omission is a mistake that consists of not doing something you should have done, or not including something such as an amount of fact that should be included, or when the patient does not get a drug that was arranged.<sup>[73]</sup> In a survey conducted on 1384 nurses in 24 ICUs in the United States hospitals regarding nurses' perception of medication errors,<sup>[76]</sup> the main causes contributing to medication errors are illegible handwriting, mental and physical health, interruption and distraction from patient and co-workers, lack of pharmacological knowledge with problems in calculations, performance deficit, sometimes lab tests are not considered, overtime of working hours, absence of self-awareness, organizational factors (training) and failure to follow protocols.<sup>[15, 46, 53, 77-88]</sup> Furthermore, it could be related to execution deficit (36.7%) and impairment of strategies realization, but knowledge, communication, drug distribution, and entry system were accounted for lesser percentages.<sup>[78, 89]</sup> However, interruptions play a big impact on causing medication errors especially during administration.<sup>[46]</sup> As it may seem, 1354 errors occurred in 136 hours, which means 10 interruptions per hour.<sup>[90]</sup> Besides, registered nurses were interrupted (36.0–57.0%), which accounted from the patients (28.0%), other nurses (25.0%), assistive personnel (10.0%), and physician (9.0%), that led to 7.0% of medication errors from interruptions.<sup>[65, 79]</sup> Moreover, around 20% of hospital registered nurses experienced frequent medication errors because of factors as overload, extra hours, unsatisfactory staffing with low support, and shift length.<sup>[91]</sup>

Lack of knowledge and miscalculation of doses are the factors contributing to medication errors.<sup>[36, 37, 39]</sup> It is noticed that competence skills in drug calculation are prerequisites to nursing registration and examining their learning abilities rather than follow strict protocol which impeded nurses thinking skills.<sup>[11, 92]</sup> Moreover, focusing on continuing education with clinical and theoretical support will help in the prevention of medication error occurrence.<sup>[15, 93-95]</sup>

## Medication Errors and Nursing

Medication errors are normally characterized as deviations from a doctor's structure. Sources of errors could be from ordering, prescribing, transcription, dispensing, and administration errors (i.e. when the patient is administered a wrong medicine). Healthcare providers as doctors, medical specialists, pharmacists, unit assistants, and nurses could be related to the incidence of medication errors.<sup>[96]</sup> A patient can get up to 18 portions of prescription for each day, and a healthcare provider can regulate upwards of 50 medications for each move.<sup>[50, 97]</sup> This places the healthcare provider at the forefront of administration accountability.<sup>[98]</sup>

Nurses are considered critical agents among the medical staff of clinics. One of the real undertakings of nurses is administering medicines to patients. They should be mindful of recognition significance of organized prescription to dodge potential dangers and conceivable complexities coming about because of medicine errors.<sup>[99]</sup>

Medication errors in clinics, for the most part, include 3.0–6.9% of hospitalized patients.<sup>[100]</sup> Customarily, to maintain a strategic distance from medicine errors, nurses utilized five privileges of the prescription organization; the correct patient, the correct medicine, the correct portion, the correct course, and the ideal time. Following

this rule before giving any prescription, can help nurses keep away from the vast majority of medication errors.<sup>[30, 52]</sup>

Most medicine executives are nurses and, in this manner, when errors happen, nurses are frequently considered responsible.<sup>[101]</sup> Medicine supervisors can give defend against errors made at any of the past stages, notwithstanding, and are thought to block around 86.0% of errors made by prescribers or medicine specialists.<sup>[102, 103]</sup> Along these lines, nurses give a security guard against medication errors at the same time, can put patients in danger.<sup>[104]</sup>

Nurses have a central role in their activities to advance safety and anticipate damage to patients.<sup>[103, 105]</sup> While this of great practice, nurses ought to assess how they work in groups to guarantee that the aggregate frameworks and procedures of training are sheltered and to help and instruct unpracticed partners.<sup>[46]</sup>

Even though that the way toward conveying medication to patients requires a joint effort between medical experts, registered nurses, and pharmacists, it is the essential obligation of healthcare providers to protect prescription administration. As indicated by Anderson and Webster administering prescription is the most noteworthy hazard undertaking a nurse can perform and can prompt destroying ramifications for the patient and the nurses' vocation.<sup>[106]</sup> Besides, the mental injury brought about by submitting a medication error can be overpowering to the nurses, they may feel agitated, blameworthy, and panicked.<sup>[46]</sup> Therefore, medication errors might not only intend harm to patients, they additionally deface the notoriety of all medical experts in whom patients place their trust.<sup>[107, 108]</sup>

On the off chance that nurses don't have the fundamental capability on providing important data and capacity for the protection of human wellbeing and life, thus therapeutic errors wind up unavoidable. Notwithstanding these, reasons, for example, numerical deficiency of nurses in the workplace, persistent conditions, restlessness, tiredness, absence of consideration, unsure employment definition, insecure working hours, improper physical conditions, having an extraordinary number of patients, could trigger medication errors.<sup>[38, 46, 53]</sup>

Execution of medical requests is a critical piece of recovery procedure and patient consideration. Nursing execution is considered a prominent role that impacts patients' safety.<sup>[109]</sup> Certain consequences as an impact on patient safety and treatment expenses will have resulted from medication errors.<sup>[110]</sup> Administration of drugs is likely a standout amongst the most basic missions of nurses since the subsequent errors may have unintended, genuine complication for the patient.<sup>[111]</sup> Medication errors can prompt unfriendly results, for example, increased mortality, increased length of hospital stay, and expanded restorative expenses.<sup>[112]</sup> Although medication errors can be brought about by all individuals from healthcare providers. Most medical and therapeutic executions are done with the nurses, therefore, nursing medication errors are the most common. Besides, nurses execute most of the therapeutic requests and invest about 40.0% of their energy in the emergency clinic to manage medicines.<sup>[113]</sup> In developing and developed countries, the nursing medication error rate is observed to be high.<sup>[114]</sup>

Medical nurses are a fundamental piece of the human services group and are in charge of the wellbeing of patients yet sadly, the expansion in complaining from medical nurses and doctors in the previous years is proof of expanded frequency of errors.<sup>[53]</sup> On the other hand, no examinations have exhibited solid connections between nurse's qualities (i.e. age, long stretches of training, and education) and the number of medication errors.<sup>[115]</sup> This would appear to show that nurses are conceivably in danger of making a medication error.

## Results of medication errors

It is critical to identify medication error, regardless of whether vital or not, because of identification the error will uncover a disappointment in the treatment procedure which causes another event of hurt. There is additional proof that the demise rate from medication errors is expanding. These increments are not amazing as of late emergency clinics have seen an expanded rate of patients, new medications have developed that are progressively hard to utilize securely and viably, factors that will in general lead to increment the danger of medicine error.<sup>[116, 117]</sup>

At the point when errors are distinguished, they can cause many disappointments because of the inability of how to deal with the resulting error, and they might cause potential harm to patients with disabilities. The backhanded results incorporate harm to the medical nurses as far as an expert and individual circumstances, decreased self-assurance, expanded pressure and clashes at work, lack of quality of the patient's family to nurse.<sup>[118, 119]</sup> Hence, the need to bring issues to interpret and manipulate the nature and reasons of errors is fundamental and can help nursing chiefs to recognize plans for improving the nature of medication administration, expanding the patient wellbeing, and lessening the extra cost.<sup>[120]</sup>

Handling medication is a high-recurrence movement in nursing; the potential for error increments when the normal number of prescriptions builds. Besides, prescription administration is an intricate procedure that is frequently performed under not exactly perfect conditions. Thus, the continuous flow of multifaceted prescriptions could prompt the occurrence of the hazard.<sup>[11, 74]</sup> There is likewise a propensity to accuse people instead of the faulty system. Be that as it may, most medication errors emerge from the requests of doctors, trailed by medical organizations.<sup>[11, 121]</sup>

A previous study about the report referring to the United Kingdom (UK) restorative safeguard associations, showed that 25.0% of all cases were because of prescription errors that included the following accompanying errors:<sup>[122]</sup> prescribing and administration errors (miscalculation, contraindicated or unlicensed medication, a wrong dose, or wrong patient), repeat dispensing without legitimate checks, failure to monitor the case, and failure to caution about antagonistic impacts (which may be that as it may, not be viewed as a medicine error).

## Reporting Medication Errors of Nurses

Reporting the medication errors is critical in improving the medication management process, therefore, it is considered a legal and ethical commitment in each health care settings. Reporting medication errors could provide an effective resource of important information, therefore underreporting errors is observed as a crucial threat.<sup>[81, 123, 124]</sup> Regardless of whether the nurse is the wellspring of a mistake, a benefactor, or a spectator, associations depend on medical nurses as bleeding-edge staff to perceive and report medication errors.<sup>[15]</sup> A previous examination has exhibited underreporting among nurses. Adding to the weight of announcing, over 90.0% are oneself reports.<sup>[125]</sup> Moreover, in Israel, 26.0% of medication errors were reported, and 46% were self-reported.<sup>[126]</sup> In Taiwan, almost 6000 to 20000 deaths from medication errors, and 10.0% of medical lawsuits were mainly of underreporting.<sup>[127]</sup> In Turkey, 66.7% of involved nurses who caused medication errors did not report it.<sup>[128]</sup>

Medication administration is a high-risk area of nursing practice. Thus, reporting a medication error is an important step based

on awareness and willingness to report it.<sup>[127, 129]</sup> This barrier might be provoked, yet focus on the person rather than a system with fear from adverse outcomes lead to underreporting data.<sup>[11, 38, 52, 61, 65, 77, 130]</sup>

Precise detailing of medication errors could result in the avoidance of medication errors. Revealing prescription mistakes is reliant on the nurse's decision making. Underreporting or not announcing medicine mistakes covers defective frameworks.<sup>[124]</sup> Besides, developing structured protocols on drug administration with an un-punitive approach could encourage reporting and improve patient safety.<sup>[131]</sup>

At present, self-revealed medication errors give negligible data to associations since disparities, as far as answered to-actual rates, are across the board. Medication errors are normally reported through institutional reporting frameworks, for example, incident reports to give information about the medication errors.<sup>[132]</sup>

Reports are created by the medical nurse who distinguishes the error and afterward is sent to the executives, quality divisions, or board offices of hazard. Detailing and reporting the issue is subject to the medical nurse in many ways:<sup>[117]</sup> capacity to perceive a mistake has happened, the conviction that the mistake warrants reporting, the conviction that she/he has submitted the error, and eagerness to beat the humiliation and dread of striking back for having submitted a medication error.

## Strategies for Preventing Medication Errors

Nurses specifically are imperative in evaluating such errors since they are, for the most part, in a situation to see medication errors directly and find a way to lessen the danger of medication errors.<sup>[133]</sup> Their uncommon position is regularly fortified by their continuous learning concerning the medications in addition to their strategies regarding planning and controlling the medicines and for checking the impacts of the treatment.<sup>[11]</sup> All nurses must get comfortable with different methodologies to forestall or diminish the probability of medication errors. Here are certain techniques to follow:

1. Guarantee the five privileges of the prescription organization

Nurses must guarantee that institutional approaches identified with prescription interpretation are pursued. It isn't adequate to translate the medicine as prescribed, however, to guarantee the right medicine is recommended for the right patient, right time, the right measurements, through the right course, and planned effectively (otherwise called the five rights).<sup>[88, 134]</sup>

2. Pursue legitimate medication reconciliation techniques

Foundations must have instruments set up for medicine reconciliation while exchanging a patient starting with one establishment then onto the next or starting with one unit then onto the next in a similar organization. Audit and check every prescription for the right patient, right medicine, right measurements, right course, and right time against the exchange (transfer) requests, or medications recorded on the exchange archives. Nurses must contrast this with the Medication Administration Record (MAR). Frequently not all components of a medicine record are accessible for simple confirmation, yet it is of central significance to check with each conceivable source including the releasing or exchanging establishment/unit, the patient or patient's family, and doctor, to forestall potential mistakes identified with inappropriate reconciliation.<sup>[135]</sup>

### 3. Have the doctor (or other nurses) read it back

This is a procedure whereby a nurse peruses back a request to the recommending doctor to guarantee the arranged medicine is deciphered accurately. This procedure can likewise be completed starting with one medical nurse then onto the next whereby a medical nurse peruses back a request deciphered to the doctor's structure to another medical nurse as the MAR is checked on to guarantee precision.<sup>[136]</sup>

### 4. Document everything

This incorporates legitimate medicine naming, clear documentation, or appropriate recording of administered medicine. An absence of appropriate documentation for any prescription can result in an error. For instance, a nurse neglecting to report an as required prescription can result in another administration being directed by another healthcare provider since no documentation signifying past administration exists. Perusing the medicine name/label and expiration date of the medicine is additionally another best practice. A right prescription can have a wrong mark or the other way around, and this can likewise prompt a medicine error.<sup>[11, 137]</sup>

### 5. Guarantee appropriate storage of medications for legitimate adequacy

Health care providers should avoid the medication storage with close or identical names or package on them at the same medication stock rack. Alphabetized drug storage could lead to unintentional confusion. Besides, it is essential to separate 'high alert' medications from other medications to avoid ambiguity. Medications that ought to be refrigerated must be kept refrigerated to look after adequacy, and medications that ought to be kept at room temperature ought to be put away in like manner. Most biologicals items require refrigeration, and if a multi-dose vial is utilized, it must be named to guarantee it isn't utilized past its lapse/expiration date from the date it was opened. Thus, it is recommended to keep it organized and control access to it.<sup>[138, 139]</sup>

### 6. Consider having a drug guide accessible consistently

Regardless of whether it's print or electronic is a matter of personal (or institutional) inclination, however, both are similarly significant in giving imperative data on most classifications of prescription, including trade/generic names, therapeutic class, dosing, nursing consideration, side effect, drug-drug interaction and medication cautionary, for example, 'don't crush, or give with the meal'.<sup>[140]</sup>

### 7. Know institution policies, regulations, and guidelines

Nurses should be familiar with the policies and guidelines and how to apply them. Since these regulations and policies could provide necessary information regarding drug ordering, transcription, administration, and documentation. Besides, it could provide information for the nurses about black box warnings, look alike, sound alike, and warning labels.<sup>[138, 141]</sup>

## Conclusion and recommendations

As penultimate, medication errors are multifaceted criteria. It is motivated to standardize the recommendation and make it a central goal all

over the globe for the best practice. Thus, it is suggested to; (a) get a deeper meaning of the medication errors concept, (b) focus on broader causes outside of the taken picture, (c) converge on clinical settings variations and patient illness severity, (d) include questions related to nurse's psychology, (e) create a group of expert to publish new guidelines internationally adapted to any changes according to hospital needs. Nurses are the heart of clinical settings, encouraged to be one integrated body to prevent the occurrence of medication errors. Thus, systemizing the guidelines are required such as education and training, independent double checks, standardized procedures, follow the five rights, documentation, keep lines of communication open, inform patients of drug they receive, follow strict guidelines, improve labeling and package format, focus on the work environment, reduce workload, ways to avoid distraction, fix the faulty system, enhancing job security for nurses, create a cultural blame-free workspace, as well as hospital administration, should support and revise processes of error reporting, and spread the awareness of the importance of reporting.

## Author Contributions

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